YPHEN

Encapsulating the best of nature

Innovations pour une approche transdisciplinaire de la formulation et de la vectorisation de molécules

ADeBIOTeCH
THINK TANK ONE HEALTH

Paris October 17th

The Mission

Soil bioremediation strategies for several green industries

Level of soil health

Remediation

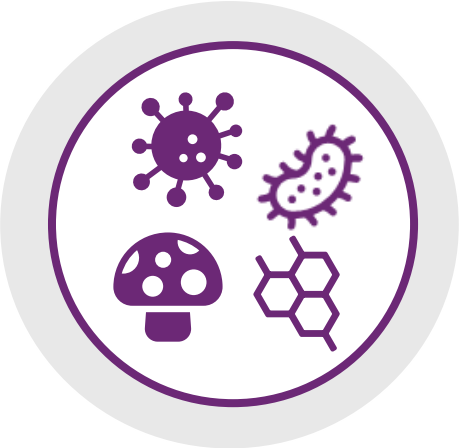
Environmental restoration

Sustainable agriculture

Development of microbial-inspired SOM booster with *biostimulation* and/or *bioaugmentation* potential

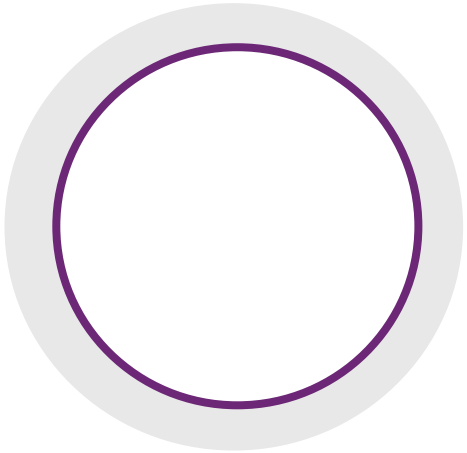
Bottlenecks:
STABILITY and COLONIZATION

The Concept: a vector with intrinsic properties as **organic amendment**



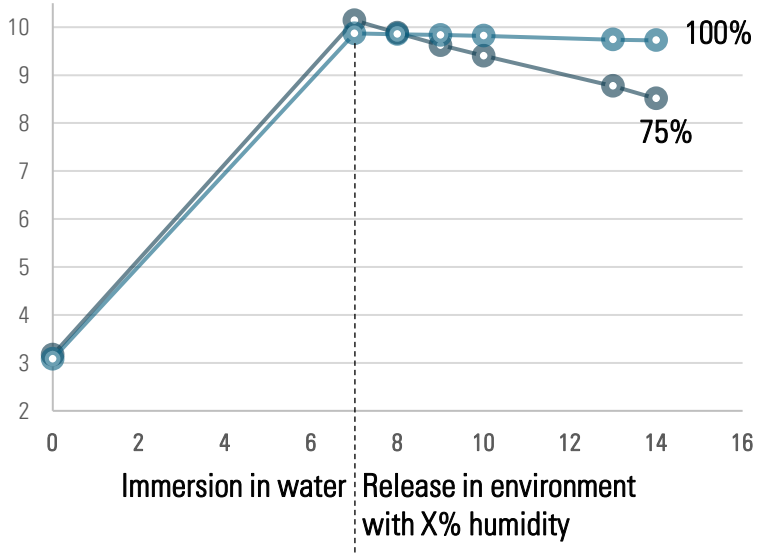
YPHEN vector has water retention and biostimulation properties

The Concept: a vector with intrinsic properties as **organic amendment**



WATER RETENTION

Evolution of the mass of Yphen vector (grams) over time (days)

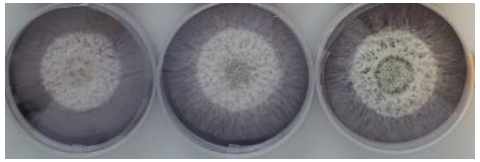


BIOSTIMULANT

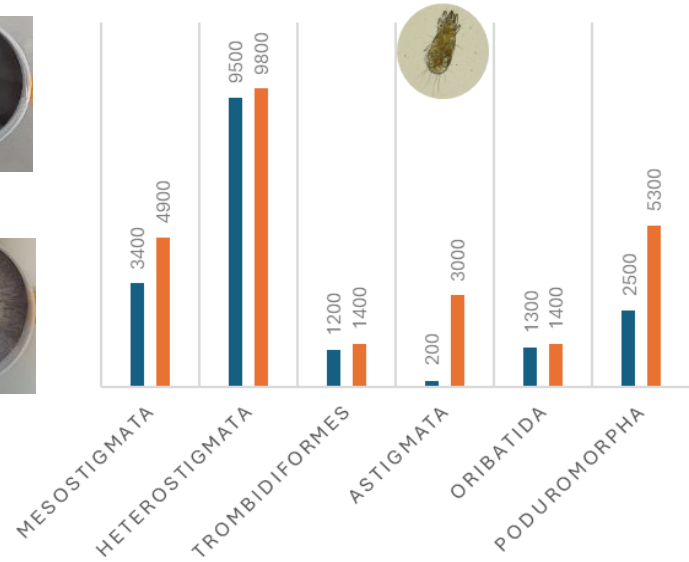
In vitro: characterization of the growth of selected bacteria and fungi

Untreated control

YPHEN vector



In soil: characterization of the invertebrate populations



How does a small startup position in the market of soil health?

Problems:

Price sensitivity

Fragmented value chains

Lack of awareness on soil degradation

Solutions:

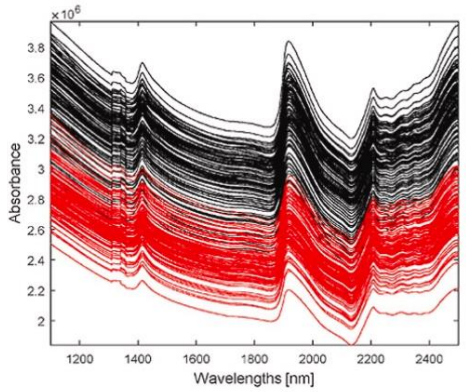
Precision applications

Lobbying for advancing regulation

Economic incentives: biodiversity and carbon credits

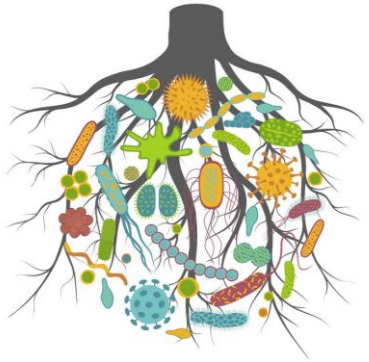
Precision application in remediation and agriculture

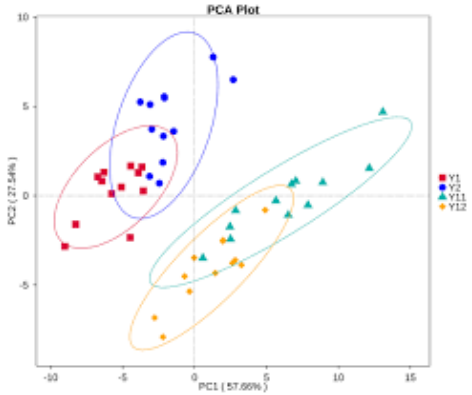
Spectral (NIR) analysis of soil



→ Precision remediation

Metagenomic analysis of soil biota





→ Precision agriculture

Biocontrol, Bioaugmentation

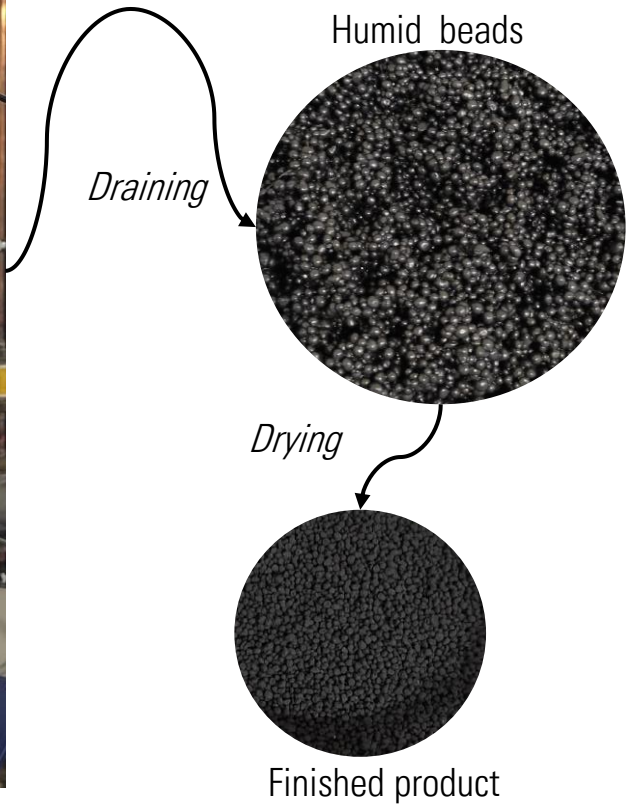
Production with methodologies borrowed to drug development or cosmetics

THE CHEMISTRY:

- Biopolymers/chemical cross link
- Additives to improve colonization and stability
- Colloidal substances for porosity

THE PROCEDURE:

Prilling apparatus



Reduced costs of fermentation for increased viability of the microbial agent upon bioprocessing and increased biologic effect *in planta*

Technology	Typical Log Reduction (Log CFU)
Lyophilisation	0.1 - 0.5 (up to 1-log)
Spray Drying	0.5 - 1.5 (up to 2-log)
Vacuum Drying	0.3 - 1.0
Fluidized Bed Drying	0.2 - 1.0 (varies by process)
Freeze Concentration	0.2 - 0.6
Emulsification	0.1 - 0.4

FORMULATION EFFICACY → more than 100%
(additives)

Stage-gate tailored support along the development of the formulated product

Low environmental impact production center

	CONCEPTION	PROTOTYPING	FIELD TESTING	INDUSTRIAL SCALE-UP
	Consulting service	6 weeks	4 months	or tech licensing
	Concept and features Business development considerations			
Production scale		Mini-factory up to 20L/batch Lab scale equipment and bench scientists	Midi-factory up to 500L/batch Pilot Unit	Maxi-factory 250L/h BIOCAP 1

How does a small startup position in the market of soil health?

Problems:

Price sensitivity

Fragmented value chains

Lack of awareness on soil degradation

Solutions:

Precision applications

Lobbying for advancing regulation

Economic incentives: biodiversity and carbon credits

Network of collaborators to participate in EU consortia to guide policymakers

European Enterprise Network
Mission Soil Platforms

STRANGHTEN RELATIONSHIPS WITH MULTIPLE STAKEHOLDER:

SMEs, University, Innovation Centers

How does a small startup position in the market of soil health?

Problems:

Price sensitivity

Fragmented value chains

Lack of awareness on soil degradation

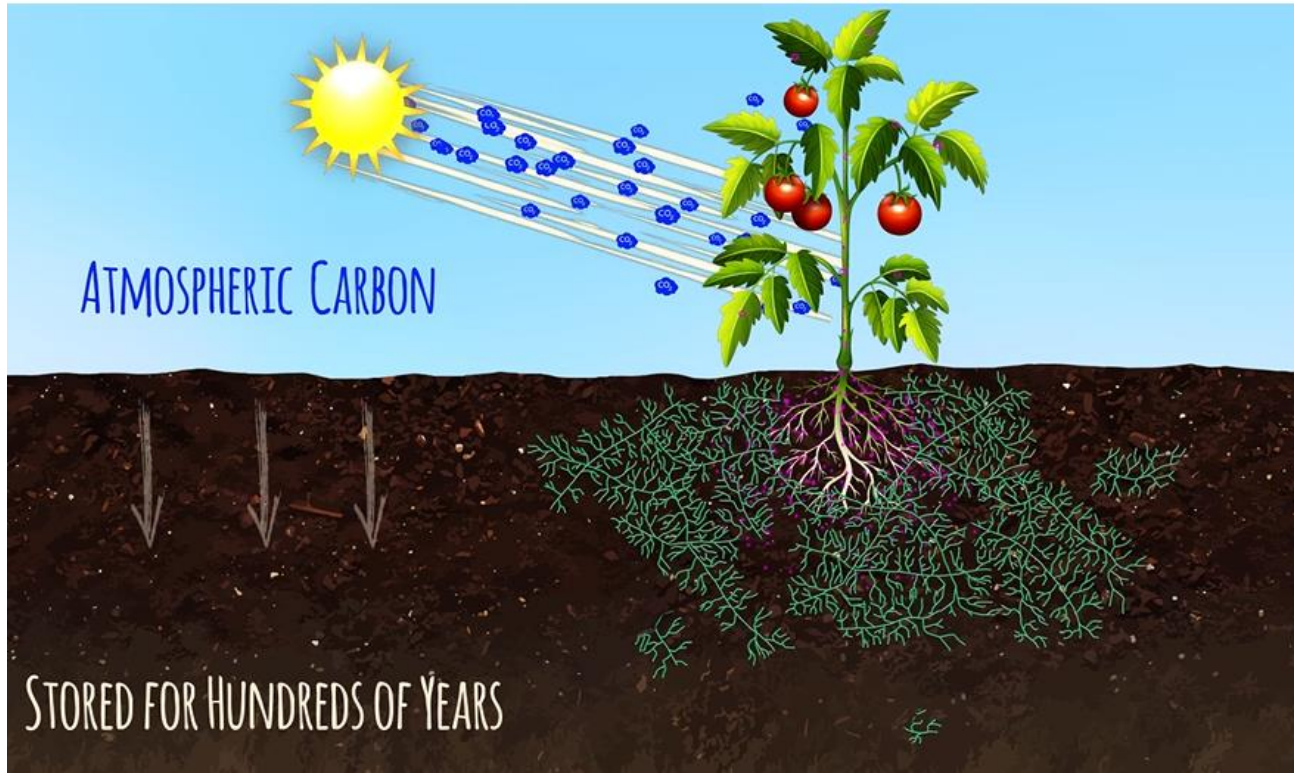
Solutions:

Precision applications

Lobbying for advancing regulation

Economic incentives: biodiversity and carbon credits

Carbon credit certification for YPHEN solutions



https://www.soilfoodweb.com

Microbial-inspired SOM booster that shift the equilibrium towards microbial degradation and stable carbon pools

YPHEN

Encapsulating the best of nature

THANK YOU FOR YOUR KIND ATTENTION

CONTACTS:

carmen.mirabelli@yphen.com
www.yphen.com

89 Chemin de la Ballastière
74200 Thonon-les-Bains
+33 6 09 90 89 08